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Docket 83727JLT
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of

Mark Lelental, et al

COMPOSITION CONTAINING
ELECTRONICALLY-
CONDUCTIVE PARTICLES

Serial No. 10/036,126

Filed December 26, 2001

Group Art Unit: 1751

Examiner: Vijayakumar, Kallambella M

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Sherryl A. Payne
Sherryl A. Payne

March 14, 2005
Date

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Commissioner for Patents

P.O. Box 1450

Alexandria, VA. 22313-1450

Sir:

APPEAL BRIEF TRANSMITTAL

Enclosed herewith in triplicate is Appellants' Appeal Brief for the above-identified application.

The Commissioner is hereby authorized to charge the Appeal Brief filing fee to Eastman Kodak Company Deposit Account 05-0225. A duplicate copy of this letter is enclosed.

Respectfully submitted,

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Enclosures

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.



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APPEAL BRIEF PURSUANT TO 37 C.F.R. 1.192

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APPELLANTS' BRIEF ON APPEAL

Pursuant to 35 U.S.C. §134, Appellants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims that was contained in the Office Action mailed October 14, 2004.

A timely Notice of Appeal was filed January 14, 2005.

Real Party In Interest

The real party in interest is Eastman Kodak Company, the assignee of the inventors' entire interests.

Related Appeals And Interferences

None.

Status Of The Claims

Claims 1-12 and 17-19 stand finally rejected and are the subject of this appeal. Claims 13-16 have been cancelled.

Status Of Amendments

None.

Summary of Claimed Subject Matter

The sole independent Claim 1 calls for a composition for forming an electrically conductive antistatic layer comprising:

electronically conductive polymer particles (page 9, lines 2-5);
a neutral-charge conductivity enhancer (page 9, lines 4-9); and
a hydrophilic polymeric binder that is gelatin or a gelatin derivative (page 13, line 1).

Thus, there are three specific components recited in this claim for an antistatic composition that is useful in gelatin-containing imaging elements. The gelatin-containing imaging layers in these elements are directly disposed over the gelatin-containing hydrophilic antistatic composition of this invention. The gelatin-containing antistatic layer also acceptably bonds to underlying subbing

layers or hydrophobic supports. Thus, the gelatin binder is necessary to provide desired adhesion to layers both above and below.

It is also critical that the antistatic composition of this invention contains electronically conductive polymer particles instead of ionic conductors so the observed conductivity of the antistatic composition is independent of relative humidity.

The neutral-charge conductivity enhancer is needed to provide improved conductivity when used in combination with the electronically conductive polymer particles that, when used alone, have some conductivity, but not enough conductivity. These two components can be optimized to provide a maximum level of conductivity and a maximum efficiency of electrostatic charge dissipation.

Issue For Review By The Board

The following single rejection is being presented for review by the Board of Patent Appeals and Interferences:

Claims 1-12 and 17-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Muys et al. (U.S. Patent 5,391,472) taken with Gardner et al. (U.S. Patent 5,910,385).

Arguments

Rejection Under 35 U.S.C. §103

Appellants respectfully request reversal of the final rejection of Claims 1-12 and 17-19.

Argument for Independent Claim 1:

Appellants have found that their particular gelatin-containing antistatic composition is useful in imaging elements that have gelatin-containing imaging layers that would be disposed directly over the antistatic layer. In addition, it also acceptably bonds to underlying subbing layers or hydrophobic supports. It was also found that despite the presence of hydrophilic gelatin in the

antistatic composition, the composition is generally “independent” of relative humidity in its performance.

The Final Rejection agrees that Muys et al. fails to teach or suggest the use of gelatin or gelatin derivatives as the binders in its antistatic compositions containing conductive polymer particles. But the Final Rejection then relies upon Gardner et al. to supply this missing teaching from its lengthy laundry list of film-forming hydrophilic binders for use in conductive formulations and layers (Col.15, lines 4-39).

The rejection over Muys et al. with Gardner et al. is believed to be in error for at least two reasons: (1) the teaching of the two references would not be combined by a skilled worker in the art, and (2) even if combined, a worker skilled in the art would not use the teaching in Gardner et al. with the teaching in Muys et al. to arrive at Appellants’ antistatic composition of Claim 1.

Considering first the combinability of the two references, Muys et al. is correctly described as teaching antistatic compositions. Applicants would point out, however, that the conductive agents of Muys et al. are polymeric “particles” that are dispersed in the latex binder that is not hydrophilic in nature (see e.g. Col. 3, lines 49-50). Muys et al. uses the latex polymer (not gelatin) to disperse the conductive particles (Col. 3, lines 51-55) and to provide suitable adhesion between the polyester film support (Col. 6, lines 14-18) and overlying layers. While Appellant’ claimed invention includes “electrically conductive polymer particles”, their binder is very different.

Gardner et al., however, is directed to conductive polyaniline protonic counter-ion complexes that are “solubilized” in various film-forming binders (Col. 15, lines 4-34). By using the term “solubilized”, Gardner et al. makes it clear that its conductive complex is not in particulate form but it is soluble or dissolved in the binder and solvent and provides a continuous, single-phase in the resulting conductive formulation (see e.g. Abstract and Col. 8, lines 14-20). While Gardner et al. makes is clear that other particles (e.g. magnetic particles) can be dispersed in the formulation, the conductive complex itself is a continuous, non-particulate film unlike the conductive particles taught in Muys et al. or those used in the present invention.

While Appellants admit that both references are directed to antistatic compositions that can be used in various media, they are directed to different types of conductive formulations: one with conductive particles that require physical contact among the particles for conductivity (Muys et al.), and the other to continuous conductive films containing a solubilized film-forming conductive complex (Gardner et al.). In Muys et al., the conductive particles are the important component whereas in Gardner et al., the conductive film carries other essential components such as magnetic particles. The Muys et al. conductive particles need to be touching for antistatic effect whereas the Gardner et al. solubilized complexes form their own conductive matrix. The uses and formulation requirements of the two references are very different and one skilled in the art would not consult Gardner et al. in considering the particulate composition of Muys et al. In other words, if a skilled worker is interested in particulate conductive materials (as in the present invention), he/she would not consult Gardner et al. in which conductive particles are conspicuously absent. However, Appellants would not consider the solubilized conductive compositions in Gardner et al. relevant to what they want to accomplish.

Another important difference is that Muys et al. and Gardner et al. are directed to different solvent systems for formulating antistatic compositions. Muys et al. is directed to providing "aqueous" formulations in which the latex binder is dispersed (Col. 3, lines 53-55). However, Gardner et al. is clearly directed to organic solvent systems in which the film-forming polyanilines can be solubilized or dissolved (Col. 14, lines 42-64). The two solvent systems are incompatible because their components are clearly formulated for specific different solvent delivery systems. Even though Gardner et al. provides a laundry list of "useful" binders, it is unlikely that most of them would be useful in the organic solvent formulations containing the noted organic solvents. One skilled in the art looking for a way to disperse the particulate polythiophenes of Muys et al. in aqueous solvent systems would not consult the solubilizing organic solvent teaching of Gardner et al.

Moreover, even if the teachings are combined, they fail to teach or suggest the claimed invention because they fail to suggest Appellants' critical

combination of particulate electronically conductive particles, neutral-charge conductivity enhancers, and gelatin (or a derivative) binder, and its particular uses in imaging elements containing other gelatin-containing layers.

As noted above, the two cited references are directed to different solvent systems. Appellants' Claim 1 is directed to a composition containing a hydrophilic gelatin or gelatin derivative as the binder. As pointed out on page 9 (lines 21-23), the present invention provides "aqueous mixtures" of the claimed components. Thus, water and water-containing solvents are required for Appellants' compositions. The organic solvents described in Gardner et al. would be very undesirable in Appellants' invention because all three recited composition components are likely to be insoluble or poorly dispersed in the organic solvents of Gardner et al. In addition, the composition of Appellants' invention provides the best advantages when coated adjacent another aqueous-based formulation (e.g. a silver halide-containing emulsion layer). Thus, there is no point to having organic solvents in the present invention that would lead to significant manufacturing inefficiencies and difficulties and environmental problems.

In addition, the use of gelatin with electronically conductive "particles" by Appellants was going against conventional wisdom because of the propensity of gelatin to swell in high humidity. With that swelling comes a reduction in conductivity in the composition since the electronically conductive particles are separated from each other (to be useful they must touch each other). Hence, the prior art (e.g. Muys et al.) teaches non-swelling binders such as latex polymers in combination with conductive particles. The Final Rejection does not point to any suggestion in Muys et al. that gelatin should be used in place of the latex polymers or that they are equivalent. On the other hand, Gardner et al. teaches "solubilized", non-particulate antistatic compositions wherein the conductive complex is uniformly dissolved throughout the formulation so layer swelling is not detrimental or a concern.

The teaching about binders in Gardner et al. is also instructive to show that Appellants' claimed invention is not obvious. In Col. 15, it provides a lengthy laundry list of film-forming binders including polymeric latexes, ionic polyesters, cellulose polymers, gelatin and its derivatives, polysaccharides, and

hundreds of other possibilities cited in literature. The preferred binders (lines 35-39) are certain methacrylate polymers, cellulose esters, polycarbonates, and polyvinyl formal. The methacrylate polymers are most preferred. There is no preference given for gelatin or gelatin derivatives and those specific non-preferred binders are “buried” in the lengthy list of hundreds of binder possibilities. Gardner et al. gives a preference for latex polymers that are not useful in the present invention.

To satisfy the Patent Statute for obviousness, the reference itself must provide motivation to pick gelatin or gelatin derivatives out from those hundreds of binder possibilities. That motivation is not provided in either Muys et al. or Gardner et al. in any form. Within Examples 1-29 described in Gardner et al., gelatin is not used as a binder even though it is listed in TABLE I (P-15). The reference fails to provide any motivation to lead a skilled artisan to use gelatin or gelatin derivatives from among the hundreds of possibilities and then to substitute them for the latex polymers of Muys et al. Thus, the combined teaching in Muys et al. and Gardner et al. fails to lead to Appellants’ unique antistatic composition and thus it fails to satisfy the law to support a Section 103 rejection. For these reasons, the rejection over Muys et al. and Gardner et al. should be reversed.

Argument for Claims 2-12 and 17-19:

Claims 2-12 and 17-19 are patentable over the combined teachings of Muys et al. and Gardner et al. for the same reasons as stated above for Claim 1 from which they depend. In addition, each of Claims 2-12 and 17-19 provide additional definitions of the electronically conductive polymer particles and neutral-charge conductivity enhancer in the claimed antistatic composition. These additional definitions are not taught in combination with the use of a gelatin binder by the two cited references.

Arguments in Rebuttal of the Advisory Action:

The Examiner has further argued in the Advisory Action that Gardner et al. clearly teaches gelatin as preferred binder in Claim 24. Appellants respectfully disagree. Claim 24 basically recites the general categories of binders

taught in the laundry list of Col. 15 (lines 10-34) but with the species omitted. Again, as pointed out above, the binder preferences in Gardner et al. are stated in Col. 15 (lines 35-39) and those preferences do not include gelatin or derivatives thereof.

The Advisory Action further argues that the PANI-protonic acid complex of Gardner et al. (Col. 14, lines 65-67) was dissolved in a solvent in an amount of up to about 2% solids whereby the presence of solid particles in the coating formulation would have been obvious. While Appellants would admit that the complex is a "solid" at the inception of its use, the operative teaching in Col. 14, lines 65-67 is that the complex is "dissolved" and not dispersed (Col. 8, lines 14-19). Thus, the solid complex particles dissolve within the solution and become a "continuous" single-phase film-forming formulation. Upon drying, the coating is still a single-phase composition containing the dissolved PANI-protonic acid complex.

Lastly, the Advisory Action argues that Gardner et al. teaches mixtures of solvents that can include water as a preferred second solvent (Col. 22, lines 18-30). While water is considered a preferred second solvent (for the binder), dichloromethane is the most preferred second solvent (Col. 15, lines 51-53). This suggests nothing with respect to Appellants' claimed invention. Water is a solvent for several of the binders in the laundry list of Gardner et al. including gelatin derivatives, polysaccharides, ionic polymers, and many others. Still other binders can be readily dispersed in water.

To illustrate this, in Examples 17-22 of Gardner et al. (Cols. 19-20), water was used as the binder solvent ("second solvent" taught in Col. 15, lines 40ff) even though it is listed as the first solvent in the examples. Polymers P-9 through P-12 were dissolved or dispersed in the water (see TABLE I to identify the polymers). Gelatin was not used in any of these examples. If gelatin was such a preferred binder to be coated out of water as a second solvent in Gardner et al., why isn't it illustrated in any of the examples? Despite the mention of water as a preferred second (binder) solvent in Col. 15, its use is not enabled.

In addition, it should be noted that not all of the aqueous compositions in Gardner et al. provided desired conductivity. Attention is

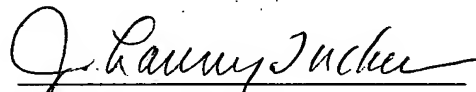
directed to Examples 18 and 19 and the data in TABLE IV (Col. 20) where binders P-10 and P-11 were used. Those two compositions provided resistivity values greater than 13 while the Gardner et al. claims call for a resistivity of 10.9 or less. Thus, it is not even predictable from the teaching in Gardner et al. that all listed binders can be used in aqueous compositions to provide conductive compositions. This teaching provides additional uncertainty from the teaching in Gardner et al. and is another reason why there is no motivation to combine Gardner et al. with Muys et al. to arrive at the presently claimed invention.

Conclusion

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner of Claims 1-12 and 17-19.

Respectfully submitted,

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Appendix I - Claims on Appeal

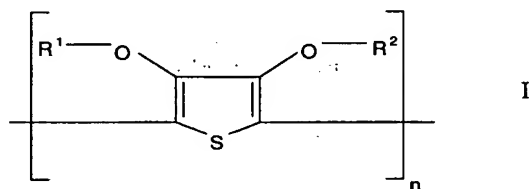
1. A composition for forming an electrically conductive antistatic layer comprises:

electronically conductive polymer particles;

a neutral-charge conductivity enhancer; and

a hydrophilic polymeric binder that is gelatin or a gelatin derivative.
2. A composition as in claim 1 wherein said electronically conductive polymer particles comprise from 5 to 95 weight % of the total weight of the composition.
3. A composition as in claim 1 wherein said neutral-charge conductivity enhancer is present in an amount of from 0.02 to 90 weight % based on the total weight of the composition.
4. A composition as in claim 1 wherein said electronically conductive polymer particles comprise a pyrrole-, thiophene-, or aniline-containing polymer.
5. A composition as in claim 1 wherein said composition comprises electronically conductive polymer particles of a polythiophene present in a cationic form with a polyanion, said polythiophene comprising recurring units

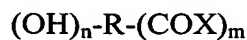
defined by the following Formula I wherein n is about 5 to 1000 and wherein R₁ and R₂ are independently hydrogen or a substituted or unsubstituted alkyl group having 1 to 4 carbon atoms, or together form a substituted or unsubstituted group or a substituted or unsubstituted 1,2-cyclohexylene group.



Polythiophene Formula (I)

6. A composition as in claim 1 wherein said neutral-charge conductivity enhancer is:

(A) represented by the following Formula II:



II

wherein m and n are independently an integer of from 1 to 20, R is an alkylene group having 2 to 20 carbon atoms, an arylene group having 6 to 14 carbon atoms in the arylene chain, a pyran group, or a furan group, and X is -OH or -NYZ, wherein Y and Z are independently hydrogen or an alkyl group, or

(B) a sugar, sugar derivative, polyalkylene glycol, or glycerol compound.

7. A composition as in claim 6 wherein said neutral-charge conductivity enhancer is a N-methylpyrrolidone, pyrrolidone, caprolactam, N-methylcaprolactam, N-octylpyrrolidone, sucrose, glucose, fructose, lactose, sugar alcohol, 2-furan carboxylic acid, 3-furan carboxylic acid, sorbitol, glycol, ethylene glycol, glycerol, diethylene glycol, or triethylene glycol, or a mixture of any two or more of these compounds.

8. A composition as in claim 7 wherein said neutral-charge conductivity enhancer is N-methylpyrrolidone, pyrrolidone, caprolactam, N-methyl caprolactam, or N-octylpyrrolidone.

9. A composition as in claim 1 wherein said neutral-charge conductivity enhancer is ethylene glycol, diethylene glycol or glycerol.

10. A composition as in claim 5 wherein said polyanion is polystyrene sulfonic acid.

11. A composition as in claim 1 wherein said neutral-charge conductivity enhancer is one or more than one compound selected from the group consisting of N-methylpyrrolidone, sorbitol, ethylene glycol, glycerol, and diethylene glycol.

12. A composition as in claim 1 wherein said neutral-charge conductivity enhancer is ethylene glycol, glycol or glycerol.

13. – 16. Cancelled

17. A composition as in claim 1 wherein said electronically conductive polymer particles exhibit a packed powder specific resistivity of 10^5 ohm·cm or less.

18. A composition as in claim 1 wherein said electronically conductive polymer particles have a mean diameter of 0.5 μm or less.

19. A composition as in claim 1 wherein said electronically conductive polymer particles have a mean diameter of 0.1 μm or less.